

CEWP PI Lot 5 BUSINESS PROGRAM

Overview report

Chinese water market drivers, technology needs, competition, barriers and how to overcome these



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Colophone

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Introduction

The Chinese market for Water Technologies is estimated to become the World's largest Market for Water Technology by 2025, if not already having this position. The growth rate during 2016-2020 was estimated to be 28%, implying substantial public and private investments of a substantial scale. The public investments are directly related to Government regulatory initiatives and adjoined investment programs.

CEWP has during the recent years organized a series of Business and Innovation Program Events, particularly aiming to help European Companies in getting access to the significant Chinese Market for Water Technologies. The Business and Innovation Program has provided insights on current and, in particular, future market requirements for water tech solutions, taking into account key game changers – upcoming regulatory changes, circular economy and digitalization

During events and webinars, with a total number of 25 during 2018-2022 and 173 presentations have showcased the Best Available Technologies for a number of water challenges in the industrial, urban and rural water segments in China and Europe. About 1.750 water experts from governments, research and business have attended the events and webinars, and contributed to the discussions and also networked and made new contacts during 2018 and 2019, until this was hampered by the pandemic.

This CEWP PI Lot 5 Final Business Program Report presents the results of the events and webinars and a number of background analysis documents prepared by the Program.

The report draws up the main conclusions of the EUCCC Position Paper 2021/2022 and key findings and recommendations of the EU SME Centre, IPR Centre, especially with regard to addressing market barriers and securing intellectual property rights.

A separate report presents case stories and lists of company presentations. (CEWP Business Program "Technology Cases and Company Presentations", December 2022 available at the CEWP web-page.

1. Executive Summary

The objective of the CEWP Business Program has been to promote exchanges regarding state-of-the-art solutions as cost-efficient and adequate solutions to current water challenges and to promote business co-operation and market access.

More than 25 events (some with several sessions) have been implemented with 173 company presentations and more than 1.750 attendees. The outputs of these events are more than 25 event reports, background reports and market reports, which are available at the CEWP web-page <https://www.cewp.eu>.

The Chinese Market for Water Technology has seen a steady growth for decades, in particular following the 10th and 11th 5-Year Plans, and speeding up following the 12th and 13th 5YPs, in particular, with the environmental targets being furthered and consolidated by the present 14th 5YP.

This plan has a number of water targets: Further investments in wastewater, huge market growth, further promote industrial water saving and emission reduction, Increase the utilization of unconventional water sources, promote comprehensive control of groundwater overexploitation and Digitalization to Strengthen the construction of water safety monitoring system:

A number of technology demands in the water market, has been identified in the CEWP events: Water Treatment technologies which can meet rising standards new investment via PPP, Industrial Water technologies to increase Efficiency gains and discharge reductions; Networks: leakage detection, water quality monitoring, modelling; Desalination: municipal market static, limited growth in last 5 years; Wastewater Treatment: rising standards, massive investment via PPP, mature market – integration to green infrastructure and ecology; Sludge Treatment: Growing investment, developing regulatory framework, at take-off – integration to energy systems and solid waste management; Sponge Cities: 16+14, moving beyond just pilots, the integration of Green infrastructure into urban planning and design was pioneered in Europe and is now being implemented on a massive scale in China.

The Chinese water market is highly competitive with State Owned Enterprises SOE's and Chinese private sector companies fully established in the core water markets. Only in niche and specialised areas can EU companies stand out. Though it is rising, the low water price for water supplied and low rates for wastewater treatment provision remains a barrier to entry for European companies as their technology often come with a higher price tag than similar Chinese technologies. Often cheaper bulk solutions are preferred due to lack of adequate financing models, economic frameworks promoting long-term sustainability as well as inadequate regulatory frameworks.

However larger European companies have shown to be capable to find a market position based on (i) offering state-of-the-art solutions, (ii) initiating the relation with the customers via customized offerings, and subsequent building of a partnership, (iii) via a dialogue and genuine interest in the performance and operations of the customers, and their actual use of the solutions, (iv) hereby gradually creating an interest in the more advanced, and costlier, state-of-the-art solutions. European technology producers and consultants could aim at building networks and being sub-contractors to these larger European companies.

The CEWP Business Program provided participants of the program events with information on market barriers and ways to overcome these. For European companies considering to enter the Chinese market there are a number of sources to consult, a.o. learning from European companies already present in the Chinese market as outlined in e.g. the present report. Further the free services of the EU SME Centre can advise market newcomers.

The EU SME Centre Beijing, a program supported by EU offers a number of services for European SMEs Specifically in connection with a market entry. They provide services to increase SMEs knowledge and raise their awareness on China and to support SMEs in developing trade with, and investment in, China. The SME Centre has developed early 200 comprehensive market reports, guidelines and case studies including some on the water market.

Another source of important information on the Chinese Market is the China IP SME Helpdesk, an EU supported project aimed to help European Companies solve Intellectual Problems in China. They provide free of charge, confidential and business-focused advice to SME's including a helpline, training workshops, webinars, website and Blog, guides and factsheets. According to their experience 80% of all SME's that fail in China fail because they did not protect their IP in China

Finally, the *European Business in China Position Paper* (Position Paper) 2022-2023 is a European Chamber's (EUCCC) publication and the cornerstone of its annual advocacy plan

<https://www.europeanchamber.com.cn/en/publications-position-paper> compiled by its 41 working groups, sub-working groups and fora. contained in the *Position Paper* illustrate both the depth of the challenges faced by European companies in China and their commitment to improving the business environment. The paper provides a number of recommendations to European Companies on how to deal with challenges in the Chinese market.

EUCCC stress that opportunities for European companies in China remain, but they must now develop strategies to deal with an ever-growing list of risks, stemming from both emerging legislation—within and outside of China—and geopolitical developments.

2. CEWP Business Program objectives and activities

The Overall objectives of the CEWP Business Program have been to:

- Present State-of-the-Art-Solutions
- Identify Market Barriers and Innovation Needs
- Facilitate Relation-building and Partnerships

The original plan was to achieve this via side-events organized at selected Water Technology Expos. However, this plan was severely hampered by the Covid endemic and instead a number of webinars have been organized. Altogether, an estimate of 173 company technology presentations have been given during the Business Program events and webinars in 2018-2022, with a total of more than 1.750 attendees.

Further, a special focus was placed on analysis of Market Opportunities and Market Barriers and presented in the “CEWP Water Technology Market Report 2021”. This report will in 2022 constitute the foundation for elaboration of a Policy Brief including a number of Policy Recommendations focusing on the “Market Functioning”, understood as to which extent market transactions notably public tenders will lead to long-term value creation for society.

In 2019, the focus was on Industrial Water Use and especially Wastewater, whereas the plan to focus in 2020 on Urban Water (Sponge Cities and Wastewater) was delayed to 2021, and the focus in 2022 was on Rural Water (Water Supply and Wastewater/Sanitation for villages and small cities).

For 2021, a mixture of webinars and physical activities regarding Urban Water was undertaken in co-operation with Aquatech Shanghai (as organizer of expo and technical operator of webinars) and the EU SME Centre (promoting companies to take part in the webinars and acting as operator of the physical events @Aquatech Shanghai. Also, the EU SME Centre represented CEWP Business Program at a MWR Business event in Wuhan in June 2021. The program in 2022 for Rural Water in November 2021 at Aquatech Amsterdam.

Emphasis was on the following topics:

- What are Best Available Technologies and do they match the Water Sector Challenges?
- Are Best Available Technologies requested by the market, or what are barriers?
- Do the operators, notably utilities, work under framework conditions, which promotes long-term economic and environmental value creation

List of knowledge-based products:

Market Reports:

- A comprehensive introduction to the Chinese Water Tech Market.
- An overview presentation of the Chinese Water Tech Market.
- Background paper on water use efficiency in the European Food and Drink sector 2019
- The CEWP China Water Market and Technology Outlook Report 2021
- CEWP Business Program Policy Report providing inputs to the overall policy report of the CEWP program, 2022

- CEWP Business Program Report “Technology Cases and Company Presentations”, December 2022
Summary Reports and PPTs:
- Reports and PPTs of Business Program Events and Webinars (In total 15 events and webinars, several with 2 or even 3 different sessions, so actually a total around 25 unique events)

Reports and other documents are available at the CEWP web-page
<https://www.cewp.eu/>

The List of events and webinars is presented below (See Annex 1 for details)

- May 3rd-5th, 2018, IE Expo, Shanghai, China
- June 27th-28th, 2018, CWEC Expo, Shanghai, China
- November 7th, 2018, side-event at HLM, Beijing, China
- December 4th, 2018, SLUSH, Helsinki, Finland
- April 12th-13th, 2019, Qingdao, China
- April 14th, 2019, IE Expo, Shanghai, China
- November 5th-6th, Aquatech, Amsterdam, Netherlands
- November 8th, 2019, side-event at HLM, Guimaraes, Portugal
- November 7th-8th, 2019, Business Expo, Guimaraes, Portugal
- November 11th-12th, EUPIC Twin Fair, Chengdu, China
- November 13th-14th, EUPIC Twin Fair, Qingdao, China
- March 16th, 2021, webinar
- March 30th, 2021, webinar
- April 29th, 2021, webinar
- May 18th, 2021, webinar
- June 2nd-4th, 2021, Aquatech, Shanghai, China
- June 9th, 2021, MWR Expo, Wuhan, China
- November 2nd-4th, 2021, Aquatech, Amsterdam, Netherlands
- March 29th, webinar
- April 19th, webinar
- May 24th, webinar
- September 13th, Side event IWA World Congress, seminar and webinar
- November 3rd, MWR Water Security Business Program, webinar
- December 12th, webinar
- December, 15th, Asia-Pacific Smart Water Utilities Summit, Singapore

3. The Chinese Water Market- drivers and technology demands

3.1 Market Drivers – regulatory steps in successive 5-Year plans

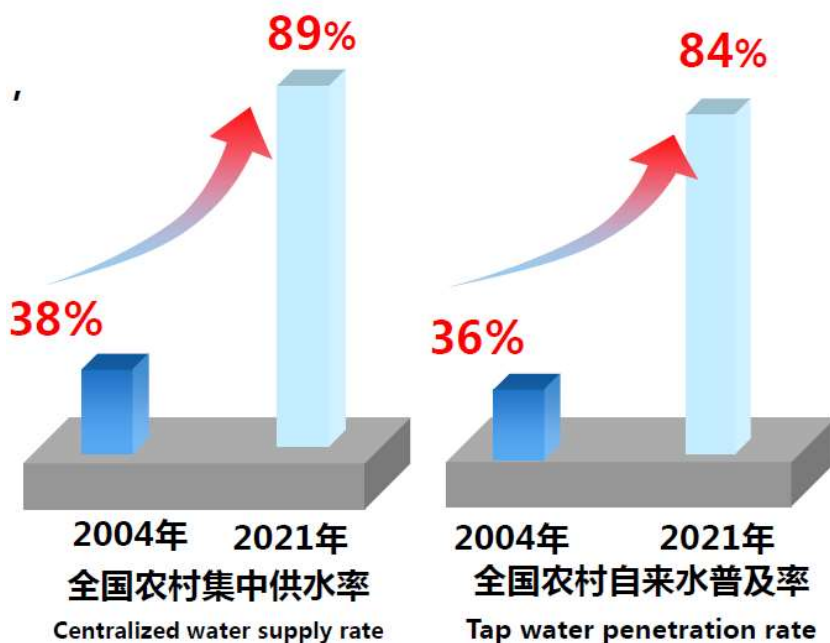
The Chinese Market for Water Technology has seen a steady growth for decades, in particular following the 10th and 11th 5-Year Plans, and speeding up following the 12th and 13th 5YPs, in particular, with the environmental targets being furthered and consolidated by the 14th 5YP.

In the 13th 5-Year Plan, covering 2015-2020, the main targets were:

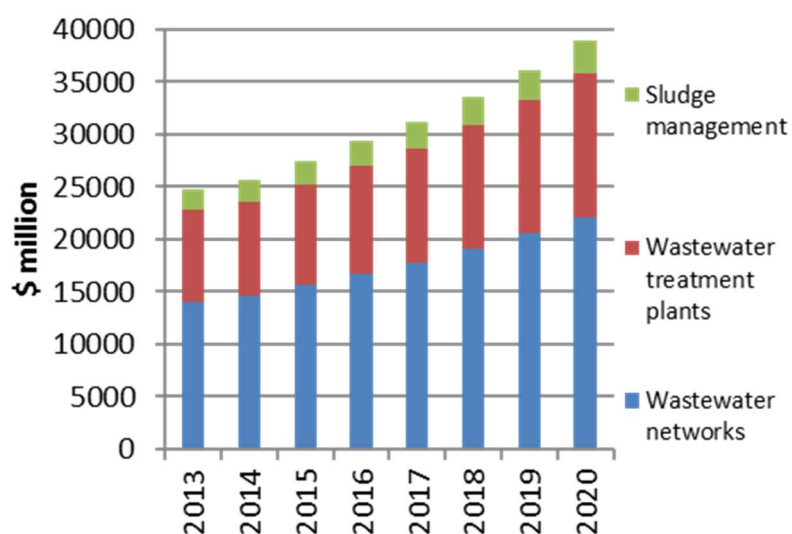
- Upgrade of municipal wastewater treatment
- New wastewater capacity
- Sludge management
- Wastewater reuse
- Installation of centralized wastewater treatment plants in all industrial parks
- All industries must meet the discharge standards in the 13th plan
- Cities to meet “Sponge Cities” Standards

According to China Water Risk, these targets were all reached within the scheduled time horizon!

Below the figure shows the achievements regarding Water Supply in China, where the SDG Goals were achieved already in 2019, 6 years ahead of the plan.



Also, the relation between the regulatory steps and market growth for wastewater treatment and sludge management is clear from the figure below:



3.2 The 14th 5-year Plan

The overall targets of the 14th 5YP and sector plans of the 14th 5YP is shown within water security / water resources supply and water quality /wastewater / industrial water sectors.

3.2.1 Overall KPIs of 14th 5YP

In the recently held Two Sessions the priorities on environment for the coming years were revealed. Below are the key areas mentioned in the report (reflects also extracts from the sector plans mentioned above):

- Take holistic steps to improve environment
- Carry out stronger actions to treat pollution in major rivers, lakes and bays and sustain progress on preventing and controlling soil pollution.
- Step up treatment of solid waste and new pollutants
- Implement measures to sort waste, reduce waste and boost recycling
- Improve policies to support environmental protection industries in conserving water and energy and recycling waste and used materials
- Adopt more region-specific approach to environmental management
- Protect biodiversity and advance the development of a national park-based nature reserve system.

It is worth noting that out of 20 KPI targets set in the 14FYP, 8 are binding targets. Of the 8 binding targets – 5 pertain to “green ecology”.

Green Ecology	Reduction in energy consumption per unit of GDP (%)	--	--	[13.5]	Binding
	Reduction of carbon dioxide emissions per unit of GDP(%)	--	--	[18]	Binding
	Share of days with good air quality in cities at prefecture level and above (%)	87	87.5		Binding
	Share of surface water at or better than class III (%)	83.4	85		Binding
	Forest coverage rate (%)	23.2*	24.1		Binding
Security/ Safety	Comprehensive grain production capacity			>650mn. tons	Binding
	Comprehensive energy production capacity			>4.6bn. tons of coal equivalent	Binding

Since China's 14th Five Year Plan released in 2021 several ministries have released sector specific Five-Year plans in the end of 2021 and beginning of 2022. The sector specific plans are cross-ministerial plans and covers environmental protection within both water, air, soil and marine ecosystems as well as a specific sector plan for water security and a sector plan for overall monitoring of the environment.

The plans are released jointly by the National Development and Reform Committee (NDRC), Ministry of Ecology and Environment (MEE), Ministry of Finance (MoF), Ministry of Water Resources (MWR), Ministry of Housing and Urban Rural Development (MoHURD), Ministry of Science and Technology (MOST), Ministry of Agriculture and Rural Affairs (MARA) and Ministry of Natural Resources (MNR).

3.2.2 Water Security / Water Resources Supply

Water Security Sector Plan in 14th YP

Further promote industrial water saving and emission reduction

Increase the intensity of industrial water-saving transformation. Improve the water supply metering system and online monitoring system to strengthen production water management. Vigorously promote efficient cooling, washing, recycling water, wastewater-saving processes and technologies such as sewage recycling and replacement of high-water-consuming production processes, etc., support enterprises carry out water balance test, water-saving technological transformation and reclaimed water reuse transformation, and encourage enterprises to carry out water audit and water efficiency benchmarking meet the standards, promote the recycling of industrial water within the enterprise, and improve the reuse rate. Implement water-saving reforms for enterprises that exceed the water quota standard in stages and within a time limit.

Promote comprehensive control of groundwater overexploitation

On the basis of determining the water level control indicators for groundwater withdrawal, scientific and rational use of land water, and reduce the overexploitation of groundwater through water saving, agricultural structure adjustment, water source replacement, etc.

Increase water supply through multiple channels, and continue to promote comprehensive control of groundwater overexploitation. Overexploitation of groundwater in the northern region, reduce groundwater overexploitation, increase water supply through multiple channels, and speed up groundwater supply

Source replacement, implement groundwater replenishment in over-exploitation areas, and gradually achieve a balance between groundwater extraction and replenishment. Promote the control and protection of groundwater overexploitation in key areas.

Increase the utilization of unconventional water sources

Strengthen unconventional reclaimed water, seawater, rainwater, mine water and brackish water in water-scarce areas, diversified, cascaded and safe use of water. Taking sewage resource utilization as an important part of water saving and open-source content, accelerate the promotion of urban domestic sewage, industrial wastewater, agricultural and rural sewage recycling.

Promote the integration of unconventional water into the unified allocation of water resources, increase the proportion of unconventional water utilization year by year, and establish an incentive assessment mechanism. Overall use of recycled water, rainwater, brackish water, etc., are used for agricultural irrigation and ecological landscape.

Give priority to unconventional water for ecological water use. Aim at the world's advanced technologies and support the research and development of unconventional water utilization technologies and applicable equipment.

By 2025:

The groundwater monitoring and management system has been basically established, and the overexploitation of groundwater across the country has been alleviated. The overexploitation of groundwater in key areas such as Beijing-Tianjin-Hebei and Northeast China has been effectively curbed.

Digitalization and monitoring:

Strengthen the construction of water safety monitoring system:

Taking the basin as a unit, improve the network of monitoring stations such as hydrology, water intake measurement and soil and water conservation system layout, implement the upgrade and upgrade of national basic hydrological stations, and promote the application of new monitoring methods. Expand the scope of real-time online monitoring, increase the density of monitoring station network layout, and improve gridding.

Strengthen dynamic monitoring of underwater topography in important reaches and sections of rivers. Intensive groundwater monitoring increase the density and monitoring of monitoring stations in key areas such as groundwater overexploitation areas and ecologically fragile areas. Monitoring of water coastline, water surface area and other elements, in important rivers, lakes, drinking water sources development of automatic monitoring capacity building. Speed up on-line monitoring and metering facilities for water intake by water consumers above designated size Construction, and improve the monitoring capacity of water intake measurement.

Strengthen the application of new monitoring methods. Make full use of high-resolution remote sensing satellites, radar, unmanned monitoring methods such as drones, unmanned ships, and underwater robots, and speed up the application of new technologies such as video and remote sensing.

Use innovation to improve the intelligent processing capability and business application level of remote sensing image data, speed up realize the full coverage of rivers and lakes, water conservancy projects, water conservancy management activities, etc.

Optimize and improve the water conservancy business network, water conservancy video consultation system, water conservancy blue letter and other infrastructure, strengthen the application of new-generation communication technologies such as 5G and Beidou satellites, and expand a large-capacity, wide-coverage, and easy-to-maintain IoT communication network. Strengthen the security situation of water conservancy network.

3.2.3 Water Quality / Wastewater / Industrial Water

Water Quality / Wastewater / Industrial water Sector Plan in 14th 5YP

Following substantial investments during previous 5YPs, China has set a lower target of 20 million m³/d of additional wastewater treatment capacity to be built over the next five years. The number is less than half the previous five-year goal of 50.22 million m³/d, reflecting the country's remarkable progress towards universalising services (municipal wastewater treatment coverage grew substantially from 32% in 1999 to 96% in 2019).

Earlier this year, China published new guidelines for wastewater reuse, raising the proportion of sewage which must be treated to reuse standards to 25% by 2025. This offers further evidence of the country's ambition to transition from capacity expansion to a greater emphasis on treated effluent quality. As part of the effort, China also aims to construct and upgrade 80,000km of wastewater collection pipelines over the next five years.

The State Council of China's general plan for energy conservation and emissions reductions – released earlier this week as part of the 14th five-year plan (2021-2025) – sets the stage for further optimisation in the field of industrial water.

The plan calls for the country's energy consumption per unit of GDP to drop 13.5% by 2025 versus 2020, and for an 8% reduction in chemical oxygen demand and ammonia in wastewater by 2025.

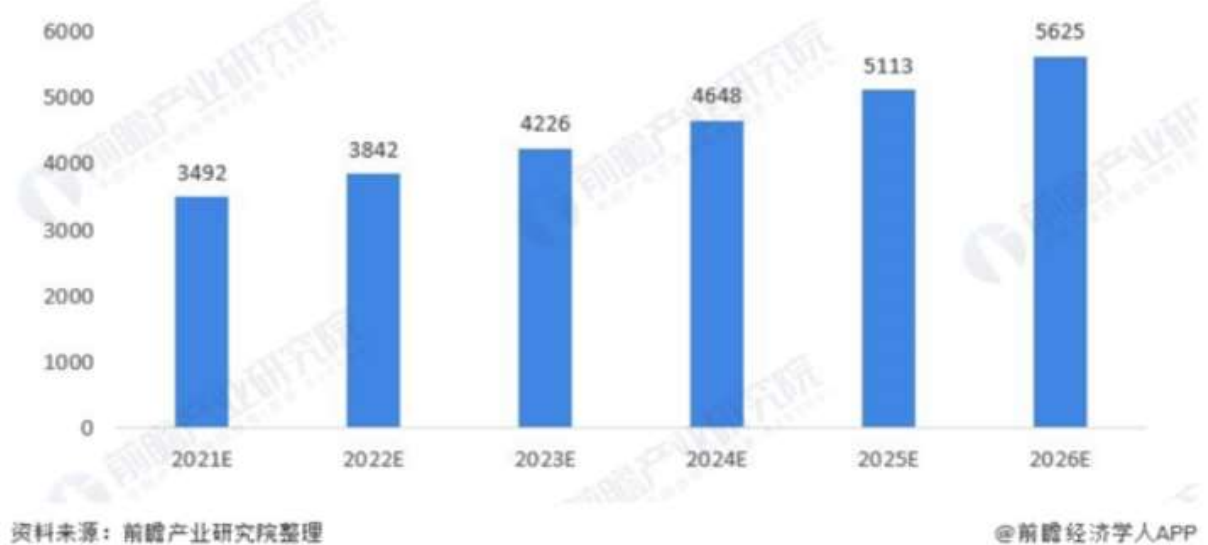
Key industrial sectors, such as iron & steel and petrochemicals, are required to undertake energy-saving measures and raise wastewater resource recovery rates, with the aim of further reducing the volume of water consumed for every RMB10,000 of industrial value added by 16%, from 32.9m³ in 2020 to 27.6m³ in 2025.

In 2020, China's total water consumption reached 581.29 billion m³, a decrease of 20.83 billion m³ versus 2019. Around 90% of the reduction was due to industrial water savings

According to several estimates, the Chinese Market for Water Technologies is predicted to become the World's largest within a few years.

A report, Analysis of the Current Situation and Development trend of China's Water Industry Market (an abstract of the report, in Chinese, can be found in the annex), made by Qianzhan Industry Research Institute (<https://bg.qianzhan.com/>), one of the Chinese most influential and authoritative research institute, estimates that the water market will keep steady growth with the support of national policies. The growth rate is expected to be 10% during the 14th Five-Year Plan period (2021-2025), and in the year 2026 the sales volume of the water companies will achieve 562.5 billion CNY.

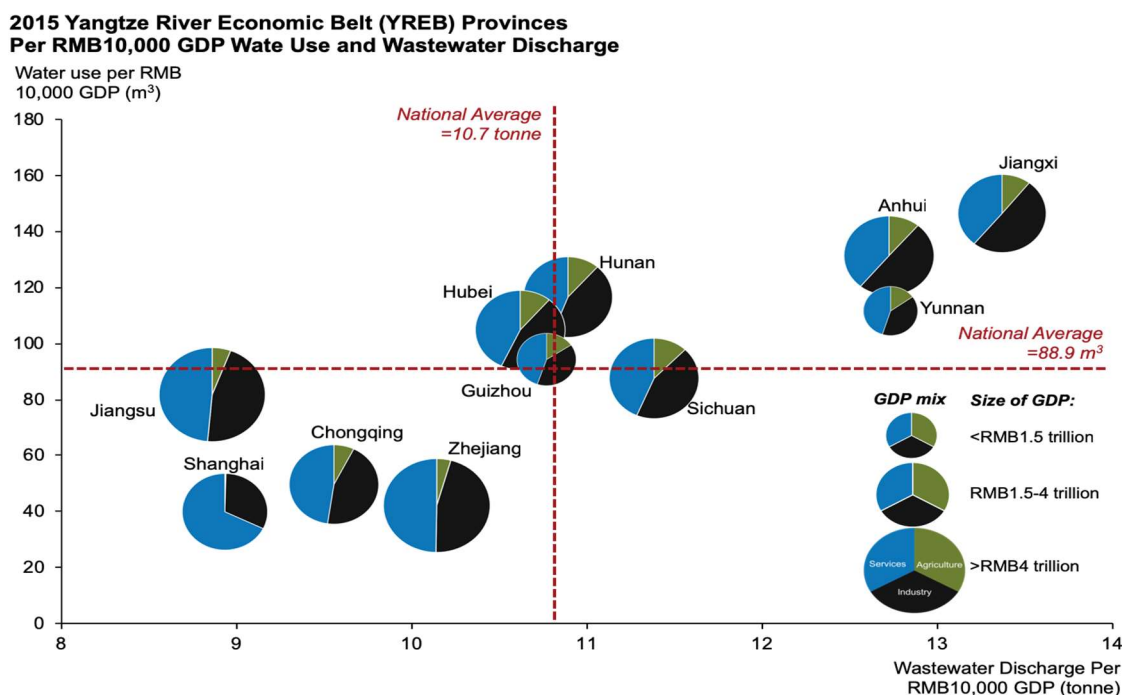
图表5：2021-2026年中国规模以上水务企业销售收入预测(单位：亿元)



3.2.4 Technology Demands

Inevitably, it is a substantial simplification to give a short, and at the same time comprehensive overview of which technologies are in high-end demand at the Chinese market seen from the stand of European companies.

First of all, “China” seen in a “Market Context” has to be seen as a continent of its own with “28 countries and 4 city-countries” each having its own characteristics, challenges and local regulation. These differences are to some extent visualized in this figure elaborated by China Water Risk:



As an example of a market opportunity report specific about China Industrial Wastewater Policy Overview and Opportunities for EU SMEs in Qingdao & Chengdu Area, a report was elaborated for CEWP by the EU SME Centre in 2019 (see annex).

Further details about specific Technology Demands is presented in the CEWP Water Market and Technology Outlook Report 2021 (see Link in annex 1).

3.3 CEWP Focus Market sector 2019: Industrial water

In 2019, CEWP hosted four Business and Innovation Program Events and prepared/identified a number of background documents /1-5/ on industrial water use with the aim of helping European Companies in getting access to the significant Chinese Market for Industrial Water Technologies and of facilitating establishment of innovation-oriented relation-building between Chinese and European experts.

Market Characteristics:

- Significant water scarcity hampers secure water supply to industries.
Several industries are characterized by a potential to increase water use efficiency, among other due to weaker regulatory requirements and pricing of water and energy. Wastewater from industries has a potential to be further treated among other due to very basic

regulations or lack of enforcement of regulations. Regulatory requirements- at national and provincial level however will increasingly be strengthened in the coming years

- Significant upgrade of regulatory requirements.

A number of legal and regulatory instruments at national and provincial level will be fully enforced in the coming years like [Water Ten Action Plan](#) and [Made in China 2025](#) (中国制造 2025), which stipulates that by 2025 the water consumption per unit of industrial value added should be 41% lower than in 2015, causing a rise in the demand for industrial wastewater treatment and recycling systems.¹ At provincial level water quota and water pollution standards are in the process of being strengthened.

- Industries faces significant policy risks.

Regulations from water authorities only relates to water, while other factors as energy efficiency, energy pricing and resource efficiency (circular economy), as well as procurement and standards are left to other authorities to regulate. For industries this gives difficulties and uncertainties in predicting policy changes, by industries known as policy risks. This makes decisions on investments in cleaner and more resource-efficient technologies difficult. Future impacts from Climate change is likely to lead to increases of water and energy prices and likely implementation of smart electricity grids. This again will lead to increasing demands for energy-efficient water technologies. Altogether, the lack of cross-sector co-ordination leaves the industries with significant policy risks.

- Market focus on “Buy Cheap” prevents “Buy Clever”.

Currently, the Chinese water technology markets are primarily dominated by low CAPEX as the key competition factor. Inevitably, this leads to long-term relatively high OPEX costs and high reinvestment needs, especially in the context of increasing regulatory demands and increasing prices. Therefore, investments made following the low CAPEX approach may lead to low resilience to these changes and accordingly low long-term value.

- Digital Transformation is gaining momentum, but unevenly implemented.

Digital transformation has enormous potential for both improved efficiency and effectiveness and the Chinese IT sector is seeing this potential. Authorities will gradually discover this and relate future regulatory requirements to these possibilities for improving the environmental situation. For industrial production as well as wastewater treatment, digital transformation will offer substantial opportunities for improved management of production, activities and asset management. Similarly, wastewater treatment plants will see significant opportunities following digital transformation.

- Tenders for B2G doesn't promote Technologies for the Future.

¹ http://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm,
http://english.www.gov.cn/policies/latest_releases/2015/04/16/content_281475090170164.htm

In many cases, current tenders may not reflect these upcoming changes, rather they are based on the solutions of yesterday. Tenders should be made in co-operation with business partners, who are fully updated about the upcoming changes and opportunities – consultancy companies. It is questionable whether today's Design Institute can fulfill this role. Lack of Financing constitutes a serious barrier for procurements focusing on long-term value.

- Overall Conclusion: Current Market Functioning leads to short-term focus.
As a final conclusion the Chinese industrial water market can be considered quite conservative and driven mainly by regulatory requirement. Demands for low cost technologies, which can comply with the regulatory requirements and only to a limited extent by costs of resources (in particular water and energy), dominates the market requests.

Perspectives for business and innovation

The Events identified niches where European Companies may get access to the significant Chinese Market for Industrial Water Technologies. Some niches are already there today and others will develop with stronger regulation as well as increasing resource prices. In the following, the short term and more long-term perspectives for European companies in the Chinese market are listed:

Short term perspectives and niche-market opportunities

- Water conservation, reclamation, water reuse and recirculation driven both by national and provincial level regulations. The market demands technologies both for local industrial water reclamation and reuse within the industry itself and in larger water reclamation schemes. There may be a niche here for decentralized reclamation schemes and technologies, as large centralized systems are expensive due to the high piping costs.
- Industrial water pollution control in particular in Industrial parks. China is relocating many of its industries like chemical and pharmaceutical industries into parks with the same type of industries. While the present regulation is quite basic there may be strengthened regulation of wastewater discharge also including specific hazardous chemicals.
- Pre-treatment of industrial wastewater discharged to municipal wastewater systems could be another niche. Heavy metals and hazardous chemicals end up in municipal sludge and prevents the reuse of sludge as fertilizer in agriculture- a procedure which is practiced in many European countries.
- Digital transformation has enormous potential both for improving efficiency and effectiveness and the Chinese IT sector is seeing this potential, implying technology transfer into the industrial water market, aiming on one hand to document compliance with regulations in a longer perspective also in reducing production costs and reuse resources within the industrial plant site.

- To be successful, EU Companies will have to find the niches in which their expertise and premium technology are valued and there are clients with the financial resources to procure their services. If companies are doing it right, the opportunities will outweigh the challenges. Such niches could be energy optimised sludge and wastewater treatment, resource reuse and industrial parks water and wastewater technology and resource use.
- Doing it right means in selected niches requires an understanding of who the real clients and key partners are and which actions need to be taken at which stage of the procurement process; from profile raising and intelligence gathering to positioning, partnering, tendering and the delivery of projects

Long time perspectives

- Climate change and increasing resource costs and circular economy will have a large impact on a future industrial water market in China. European Companies will have an advantage as these drivers in addition to strong regulation are increasingly driving the European market today. CEWP events provide a forum for dialogue on how these drivers may also in the future drive the Chinese market including the regulatory requirements, management procedures and new technologies needed. Maintaining and extending the dialogue between China and Europe on this topic seem crucial for the development of these future markets and for Chinese water management.

3.4 CEWP Focus Market Segment 2020-2021: Urban water

In total, four webinars constituted the full series. They were followed by an aggregate of more than *300 participants from 20 countries*, mostly but not only China and European countries, explored the management of the Urban Water Cycle in Europe and China. The webinars presented experiences and case studies and discussed various aspects of Urban Water Management including: blue-green and sponge cities, efficiency of water infrastructure, digitalization and water sector carbon footprint². The webinar series were followed up by a physical event at Aquatech Shanghai in June 2021 as well as a presentation given by the EU SME Centre at the business exchange meeting at Water Expo China in Wuhan also in June 2021.

Market Characteristics

The Urban Water Webinar Series organized by the CEWP Business Program during 1st half of 2021 concluded that challenges facing the Water Sector could to a large extent be addressed, if already existing technical solutions and services were fully utilized. Needs for technological innovation still exists, with the main needs being systemic innovation improving sector integration and allowing for a holistic approach to the full water cycle, e.g. in order to facilitate increased reuse of water.

² Presentations, recordings of the webinars and webinar reports can be found at <https://www.cewp.eu/waterurban>

In addition, state-of-the-art solutions offers stronger resilience to climate change and a better take-up of the potential related to digitalization and circular economy. Digitalization will allow for significant larger amounts of data to be analyzed, hereby de facto leading to actual realization of the intentions behind various concepts about integrated approaches developed within the water sector during recent decades. Circular economy-based solutions will in particular imply a stronger integration of water and energy, hereby leading to new business models to be developed.

While state-of-the-art solutions are in general costlier, they have a significantly better Operational and Maintenance costs profile, whereas bulk solutions using simpler technologies are cheaper to procure. However, a.o. due to lack of adequate financing models, economic frameworks promoting long-term sustainability as well as inadequate regulatory frameworks, the cheaper solutions are preferred during a majority of most tender processes. Further, lack of pricing based on true costs of water and energy, as well as total cost of ownership, also adds to the picture of inefficient use of funds in the water sector.

The *Setting the Scene* speeches as well as the *Company Technology presentations* referred to the following main drivers: *climate change, increased water demand from urbanization and industrialization, and pollution due to inadequate wastewater treatment and inefficient enforcement*. The main enablers referred to were: *digitalization and circular economy inspired solutions*.

In particular, the link between water and energy solutions were central to most webinars. The present discussion report builds on the webinar reports and *take away messages* from the roundtables, the chair and rapporteurs' observations of the key results of the webinars as well as good experiences presented by the speakers of the webinars. The roundtables organized in each webinar focused on the framework conditions, which would be necessary to implement the technologies available, and forms the basis for the recommendations presented in this report.

Another main conclusion was the market functioning, which besides a few cases involving large players with capacity to independently establish their own long-term perspective on the market and technology perspectives of, say, 2030, indicated serious efficiency gaps between national, environmental and water security targets and adjoined budget allocations, and the actual market transactions via tenders.

Eg. the market functioning overall doesn't support long-term economic efficiency, resilience to climate change, cross-sector perspectives notably energy use efficiency or update of digitalization.

A third, main finding relates to the "Sponge City Market", where mechanisms to ensure the technical findings of Lot 3 CeCoSC – that optimal long-term value creation to society needs combinations of so-called 3PA and BGI and synergies with other sectors - to be retained at "the market". In other words, that this overall, cross-sector approach is retained when "translating" urban planning and investment schemes of this field into individual, budget expenditures. And also to allow for exchange of international experiences by involving international consultants during the

initial stages – screening, scoping, strategy and priority setting, public planning and eventually investment schemes.

In the following, the main observation points regarding the two prominent enablers, digitalization and circular economy are presented.

Observations on digitalization.

China and Europe are both aiming at developing new digitalization solutions to improve the efficiency of their urban water management, however in different contexts. Overall, Chinese cities sees increasing urbanization (with the 14th 5 Year Plan setting a target for 2025 of 65% compared to today's 61%) and construction of new, urban areas, compared to a stronger focus on retrofitting existing urban areas in Europe.

Digitalization in the water sector has a big potential and digital water technology is largely already available and the water sector is already using it and benefitting from digital transformation. To get the full benefit of digitalization, a focus on human interaction with technology is still very important and training is needed for those who work with and operate the technology. To many people in the water sector, digitalization is still approached using an “analog” mindset, aiming at optimizing water management, rather than using a “digital” mindset with the aim to transform water management.

Digitalization has entered all water subsectors, including water quality and water quantity management in water supply and waste water systems, leak detection, flood management and early warning, irrigation systems and catchment management.

Digitalization technology is fast developing at all stages of the water management cycle including monitoring and metering systems of data, data collection systems, data management systems and intelligent information systems.

Availability of sensors with a potential for real time monitoring is essential for fast management response both in e.g. flash flood early warning and management and in water quality and quantity protection and management. However, sensors (or other monitoring equipment) able to detect advanced, chemical parameters in real-time on-line are in most cases still to be innovated.

Digital solutions will challenge the existence of silo's and current institutions set-up in urban water management. With increasing ability to perform *data crunching* at an unprecedented scale, the current institutional and geographical boundaries will increasingly constitute a barrier for efficient solutions. Vested interests in existing structures will be a special element to address. Of particular importance is the connection of the silos for water supply and waste water treatment and the integration among decision makers.

Procurement of digital water solutions may not be well specified in tenders. ISO 55000 and other related standards can be used to make the demand/requirements for the IT water solutions more precise. This is particularly important in multi-stakeholder water management systems like e.g. catchment system with many different management needs.

Asset management. Major water companies such as Beijing Water Enterprises, Sound Group etc, have rapidly increasing inventories of assets and are developing more advanced asset management systems. Most of the maintenance is still done in fairly manual labour-intensive ways. There is great interest in introducing more advanced automated systems and predictive strategic asset management solutions. However, the low labour costs mean that even the most efficient state of the art cost saving methods used in the EU could be more expensive to run, let alone install, compared to current practice. With rapidly rising labour costs and more labour safety and protection this equation is shifting and there is increasing potential for intelligent asset management offers.

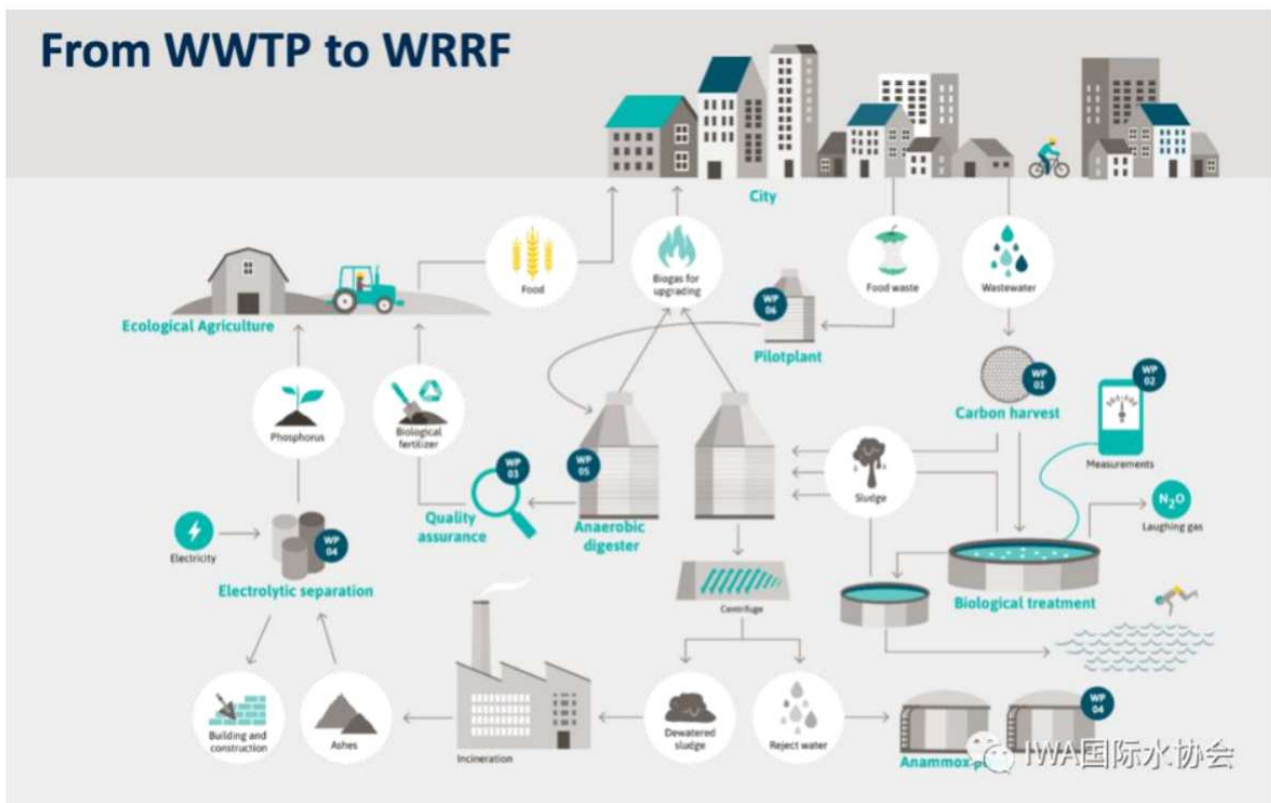
Observations on circular economy.

Circular Economy has become prominent in both European and Chinese policymaking. Chinese and European perspectives on a circular economy share a common conceptual basis and exhibit many similar concerns in seeking to enhance resource efficiency. The Chinese perspective on the circular economy is broad, incorporating pollution and other issues alongside waste and resource concerns, and it is framed as a response to the environmental challenges created by rapid growth and industrialization. In contrast, Europe's conception of the CE primarily has an environmental scope, focusing more narrowly on waste and resources, and opportunities.

In Europe circular economy approaches are also emerging as an approach to reduce the emission of CHG's. Globally 4% of all electricity is used in the water sector to supply water for human consumption, food and industrial production and waste water treatment. An increased efficiency of the urban water cycle will make more water available but also reduce the emissions of CHG's and make more resources in waste water available for reuse.

Trends in Europe are towards integrated water and waste water systems, reduction of energy use and CHG emissions per volume of water managed and an emerging integration of water and energy systems. In China energy use and CHG emissions per volume of water managed has been increasing due to a.o. more extended treatment. The potential to reduce the CHG emission and the recovery of resources is considered to be significant, although validated are not available.

From WWTP to WRRF



Circular economy-based solutions in the water sector have a big potential and technologies are largely already available and the benefits in terms of water and resource savings and reduction of CHG's has been demonstrated in many countries including Europe. Key elements of reducing the carbon footprint and saving resources in waste water treatment systems are: Increased process control, variable operation of pumps etc. depending of the load, carbon harvesting for biogas production, deep process control and knowledge and combined heat and power installations and can even make waste water treatment and water supply systems energy-positive.

A move from the concept of Waste water treatment Plants to Water Resource Recovery Factories to save resources has been promoted primarily in research and demonstration projects, however is increasingly emerging as a new concept in advanced larger water organizations.

Circular economy solutions are increasingly supported by digitalization technology including monitoring and metering systems of data, data collection systems, data management systems and intelligent information systems.

Integrated water and energy and resource reuse systems increase the outcome of Circular economy solutions and may reduce the impact of the existence of Silo's among institutions involved in urban water and energy management. Of particular importance is the connection of the silos for water supply and waste water treatment and the integration among decision makers. In these sectors.

Procurement of water and energy solutions may not be well specified in tenders. standards can be used to make the demand/requirements for the solutions more precise. This is particular important

in multistakeholder water management systems like e.g. catchment system with many different management needs.

Water supply and waste water treatment organizations are natural monopolies and may need incentives and/or regulations/goals from regulatory bodies to take actions in investing in reduction of carbon footprint and recovery of resources.

Investments in Energy savings, energy production from biogas and utilization of water borne energy may in some cases have short pay- back time. Ring-fencing the economy of water and waste water organizations is a necessary condition for keeping the savings in their own organization. Also, in case a waste water treatment plan can be made energy positive, it should be possible for water organizations to sell/provide their energy surplus to the energy network or other energy users.

In connection with the webinar on Carbon Footprint, two background reports were made:

Circular Economy in the Wastewater Sector

https://www.cewp.eu/sites/default/files/2021-05/CEWP_Whitepaper_Circular%20Economy%20of%20Water%20in%20Waste%20Water%20Treatment_final.pdf

China Carbon Neutrality 2030/2060 in the Water Sector

https://www.cewp.eu/sites/default/files/2021-05/China%20WW%20carbon%20neutrality%203060%20path%20and%20solution%20report_NORD_IQ0428.pdf

Main findings from the events:

- Digitalisation brings up the importance of breaking down the silos which has been addressed multiple times – both from a regulatory framework point of view and from a customer point of view
- More untapped opportunities will request an organizational change that digitalisation could possibly bring
- The conceptual move from WWTP to Water resources recovery factories has been not only promoted primarily in research & demo projects, but also in advanced larger scale water organisations.
- The implementation and stage execution of the environmental focuses of the 14 FYP is key to reaching several government targets.
- In both seminars, the Setting the Scene speeches as well as the Company Technology presentations used the same main drivers of climate change, increased water demand from urbanization and industrialization, and pollution due to inadequate wastewater treatment and inefficient enforcement as main references for the challenges facing the water sector.

Conclusion drawn:

The urban water management webinars supported the observations made in other CEWP seminars and workshops that challenges facing the Water Sector could to a very large extent be addressed, if

already existing solutions were fully utilized. Needs for technological innovation still exists. However, the main needs are for systemic innovation improving sector integration allowing for water supply and wastewater management to be monitored, analyzed, planned and managed by the same organizations, e.g. in order to facilitate increased reuse of water.

While state-of-the-art solutions are in general more costly, they have a significantly better O&M cost profile, whereas bulk solutions using simpler technologies are cheaper to procure. However, due to lack of adequate financing models, economic frameworks promoting long-term sustainability as well as inadequate regulatory frameworks, the cheaper solutions are preferred. Further, lack of full pricing based on true costs of ownership, also adds to the picture.

3.5 CEWP Focus Market Segment 2022: Rural water

Almost the entire rural population in China have now gained access to enough clean water. China fulfilled the SDG for water supply in 2019, six years earlier than the global target date. Health issues related to water supply safety has been improved - including microbial contamination, fluoride and brackish water. Also access to tapped water has been improved significantly at the rural level. Both the central and provincial governments have supported this impressive development.

The plan is to increase the coverage from 83% to 88% in the rural areas. Other plans include improved water source control and restriction of use, standardization of water supply systems, improve management systems, reform of pricing structure and financial mechanisms and also support to ageing infrastructure.

Different investment policies are applied in Chinese regions depending on regional needs. User participation has been introduced, as well as safety management systems and a subsidy funds established to secure maintenance of installed systems. A supervision system and inspection mechanism has been established as well as a hot-line to the Ministry of Water Resources.

The challenges and targets of the 14th 5-year plan includes an increased supply and coverage in the rural areas as well as securing water for the development of small-scale rural industries.

Two main groups of Chinese challenges were mentioned:

Guarantee degree of China's rural water supply is still to be improved

- Existence of regional development disparity
- The problems of rural water supply still exist
- The overall level of rural water supply guarantee in China still needs to be continuously improved.

The demand of rural residents is increasing

- Increase of drinking water demands with the improvement of people's living standard
- Increase of rural water demands for the rural secondary and tertiary industry development
- Improve of drinking water standards
- The target of the 14th 5-year plan is to increase the coverage from 83% to 88% in the rural areas. Other plans include improved water source control and restriction of use,

standardization of water supply systems, improve management systems, reform of pricing structure and financial mechanisms and also support to ageing infrastructure.

Digital solutions using sensor technologies and modelling tools can significantly improve the management and control of drinking water supply sources, waste water treatment systems and improve flood protection. Standardization systems like ISO 55000 has shown to be a valuable tool to help clients prioritize e.g. their maintenance needs.

Nature based systems like wetlands to treat waste water (both the water phase and sludge) has shown their efficiency globally. Different systems exist with e.g. reeds and trees as the main biomass produced and sludge phase dried and used in agriculture. Application of air into the constructed wetlands increase their treatment capacity and reduces the area of the systems per person equivalent to up to 25%.

From the roundtable discussion it appears that European companies are fully able to find a market position based on offering state-of-the-art solutions, but initiating the relation with the customers via customized offerings, and subsequent building of a partnership, via a dialogue and genuine interest in the performance and operations of the customers, and their actual use of the solutions, hereby gradually creating an interest in the more advanced, and costlier, state-of-the-art solutions.. European technology producers and consultants should aim at building networks and being sub-contractors to these.

It is, however, not possible to copy solutions from one region to another regions (one size does not fit all and that lack of data on locations of e.g. pipes makes it difficult to apply some digital solutions. Further, it should also be noted that there are advantages in cooperating with smaller water companies as they are still quite experienced and has less cooperative political constraints and is more interested in practical solutions.

4 Chinese Water Market Barriers- competition and how to overcome barriers

For EU companies wanting to engage in this new economy in China there are a number of barriers that they must understand and overcome. Huge Chinese SOE companies have developed and are dominating many areas of the market. Building partnership, or supply chain relationships with them may be more productive than directly competing. These companies have access to various forms of finance that they can bring to compete for PPP contracts.

There are particular barriers for EU companies when trying to engage with the SOE's for major infrastructure projects. Much of the high value, specialist expertise of EU companies is most relevant to the early planning, feasibility and preliminary design phases of a project. The core construction and operation will be done by locals at commodity prices. However, these early stages are often poorly funded. Until there has been financial close and authorization of the scheme no one wants to spend much money. It is normal practice that design institutes will undertake the early stages of work for free, on the understanding that if the project proceeds, they will get a bonus payment and a large part of the detailed design phase. It is very difficult for EU companies to engage in this business model. This is also a reason why projects in China may be poorly conceived and rushed, because nobody really invested the time and attention to optimizing the plan and design at the early stages when the most value can be added.

Market positioning and competition inevitably varies in market segments and geographical regions. The Chinese government has come up with regulation, improved water quality criteria and life cycle cost and that European SME's needed to align themselves with how the Chinese side develop their water sector. This would include framing their value proposition in terms of lifecycle cost, risk management, regulatory compliance and operational optimization in general. Also worth noting is that climate change issues and energy efficiency is quickly getting more attention in the Chinese water market.

Obviously, absence from the market in more than 3 years (2020 and 2021, and expectedly also 2022) for non-established companies will imply a strong element of "starting-all-over-again" regarding market understanding, revitalizing partnerships, relations and network, as well as increased competition from local market players with new and improved solutions.

Having said this, other factors point to a more level-playing-field market, e.g. with solving problems related to IPR-fraud improving and an overall better business environment for SMEs emerging. With SMEs often being the provider of new solutions, they are very important of technology transfers as a contribution to prevailing water management challenges. In this context, it is in the interest of China to facilitate entry of such new players to the market.

Further, with the appetite for digitalized solutions continuously growing in the Chinese water sector, and strong interest in state-of-the-art technologies thriving, international companies able to identify the right market niche and having/developing the right understanding on how to adopt to local needs and conditions, can still to do very good business in China.

At the same time, despite the Chinese Governments' strong ambitions for improving the quality of the environment, including water, as reiterated in the targets of the 14th 5-Year Plan, the market functioning has developed at its own path and pace, with most tenders being made according to older standards, hereby de-facto favoring bulk/standard solutions rather than state-of-the art solutions.

To conclude, while exploring the vast scale and growth rates of the Chinese Market, companies will be recommended to be well-prepared and considerate about their anticipated market niche and market entry strategy. Further, to facilitate international technology transfers as a means to addressing the water quality and water supply challenges, improving market access for international companies is highly recommended.

5 Lessons learned by companies already active in China Water Market

It appears from the CEWP events that larger European companies (of which many are present in the Chinese market already) are fully capable to find a market position based on (i) offering state-of-the-art solutions, (ii) initiating the relation with the customers via customized offerings, and subsequent building of a partnership, (iii) via a dialogue and genuine interest in the performance and operations of the customers, and their actual use of the solutions, (iv) hereby gradually creating an interest in the more advanced, and costlier, state-of-the-art solutions.. European technology producers and consultants could aim at building networks and being sub-contractors to these larger European companies

Companies like Veolia introduced Veolia's operations in China over the last 20 years to the present day. This demonstrated how much tougher environmental standards (especially water quality standards, draining, discharge and river quality) have been introduced in China and a much stronger regulatory environment established for enforcement. This is according to driving new and more advanced technological solutions which require greater levels of management and organisation to implement as well as new financial models and relationships. To succeed Veolia found that you have to bring something new to the market and be able to work with local partners to deliver that technology in a cost-effective manner. Veolia informed that in their experience "return of investments" based on "market principles" usually do not work well in China, but most can be reframed in terms of lifecycle cost, risk management, regulatory compliance and operational optimization in general. Climate issues are becoming more important in the Chinese water sector. Both water and energy efficiency and material reuse should have more importance.

VEOLIA: We are facing more and more competition from local companies. They may lack the technology but they have cashflow and local political relationships. They are increasingly then licensing in the technology they require. Despite continuing to grow our water and wastewater concession business, in the last decade we have gone from No.1 to No.7 by market share in China

SUEZ have been in China more than 20 years and have a number of Municipal and industrial projects there in e.g. industrial parks. All around China local governments have been establishing industrial parks to attract investment and development. Many are labelled as Green or ECO parks. Reality of how sustainable and successful they really vary greatly. The ideal is that a well-planned industrial park can enable circular economy action by which the wastes from one enterprise can be the raw material for another with coordinated and shared materials and energy processing, handling and exchange systems. SUEZ is a pioneer in introducing the technology required to make this happen. Ideally integrating hard process engineering and centralized treatment with nature-based solutions such as wetlands and agricultural production. This also requires innovative business models and cooperation between the enterprises, government and service providers. Tighter standards and requirements to meet environmental improvement objectives are driving this transformation. Older heavy, single industry industrial zones are being decommissioned and replaced with integrated industrial parks. SUEZ are very selective about which projects they engage in. They are approached for thousands of projects, consider hundreds and actually involve themselves in a just 20 cities, 10 parks and about 60 individual industrial sites across China. Must be very selective and the main key to success is the quality of relationships with the local government and enterprises.

SUEZ informed that they would be happy if they had the same rules between Chinese and foreign companies applied in the same way. But this is not the case. The new PPP based contracting environment should be an

opportunity for us, but in fact it is more of a barrier. The local competitors have very different access to finance and are able to bid at lower capital prices. However, their solutions, though lower capex compared to ours, represent much poorer value over the contract period. The Clients still need to be educated about this.

Ijinus working with Internet of Things are applying their technology in the Chinese water and wastewater sectors as well as for SMART Cites applications. They currently produce their equipment in France and are importing to China and selling through local partners. They are moving to a local manufacture model to allow for growth and to overcome the many restrictions and difficulties of import-export procedures. As relatively new entrants to China they found the language and cultural barriers to be significant. Their biggest challenge is in communicating the concept that through the use of their products the customer can achieve much greater value over the life cycle of their investment, but that the solution is not minimum capital cost – rather maximum lifecycle value. By knowing the state of a system and condition of components operation can be more efficient, quality higher and maintenance more targeted..To keep ahead in the market they realize that they must keep innovating. The Chinese competitors learn fast and develop so they must always be able to offer a better, more reliable and better-quality product.

HTCcycle have developed a hydrothermal carbonization process for the treatment of sewage sludge. This batch processes sludge at about 170 - 250 °C and 20 atm pressure at which point in a period of a few hours the sludge will be converted to a mixture of a Bio-coal residue and an easily separated fluid portion very rich in phosphorous and nitrogen nutrients. These can be converted into valuable products. Bio-coal into activated carbon for use in tertiary wastewater treatment processes and then incinerated or used as a soil conditioner. The Liquid residual can be separated and processed to extract the phosphate mineral Struvite, Ammonia, ammonium sulphate and Phosphoric acid. These are each high value products. There is no bio gas production, but the energy content of the Bio-coal is high if incinerated. HTCcycle have established manufacture of a pilot plant in China with pressure vessels produced by a local partner and are now in the process of seeking partners and investors to scale up the process and implement at multiple sites in Chinese cities. The proposal is that their process is better able than any other sludge treatment process, to energy efficiently convert the waste material of Sewage Sludge into a range of high value products that form part of a circular economy.

The AVK Group was founded in 1941 as a privately-owned industrial group currently comprising +100 companies worldwide. The group is well established in the Chinese market. The develop and produce valves, hydrants and accessories for water and gas distribution, sewage treatment and fire protection. Furthermore, AVK has built up strong brands supplying products and solutions for various industrial sectors and within advanced manufacturing.

Siveco has been active in China since 2004. Siveco helps environmental projects owners-operators optimize their assets lifecycle and ensure regulatory compliance through the implementation of Smart O&M solutions, by combining O&M expertise and innovative technologies. Siveco cooperates closely with their partner sand clients in China and has implemented more than 1000 projects in China.

6 Advice to European companies considering to enter China Market

In addition to build on experiences of European companies already present in the Chinese water market, there is a number of organizations in China supported by EU, where companies considering to enter the Chinese water market can get assistance.

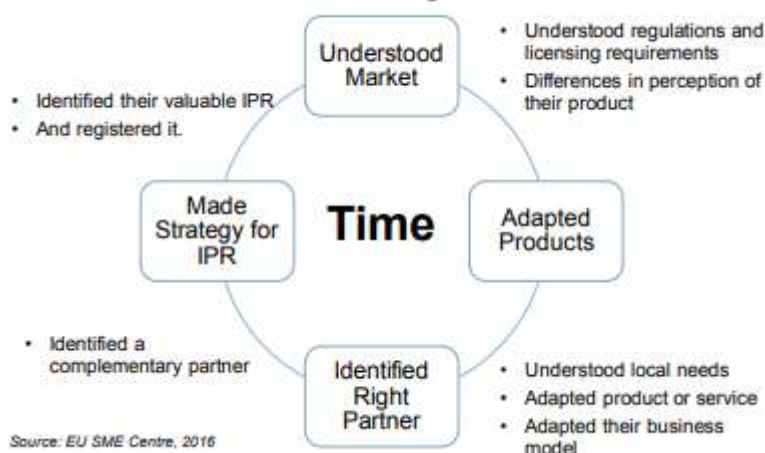
The EU SME Centre (<https://www.eusmecentre.org.cn>) is a project funded by the European Union in 2010 to help European small and medium sized enterprises (SMEs) get ready to do business in China . It is implemented by 6 chambers of commerce. The center is an official member of European Enterprise Network (EEN), partnered with over 270 government agencies and business support organizations in Europe and China. The center has a network of over 170 China experts worldwide, with a local office in Beijing staffed with In-house experts on market Access, Business Development, Legal, HR and Standards & Conformity.

The EU SME Centre can advise market newcomers The EU SME Centre Beijing offers a number of services for European SMEs Specifically in connection with a market entry:

- The EU SME Centre lists a number of recommendations of newcomers to the Chinese Market:
- Understand the market and the procurement processes.
- Match to the needs and expectations of the clients.
- Map the revenue streams of the clients and the supply chain.
- Best chances of successful entry are in niche, emerging **or high-risk areas**.
- Keep the product simple. Express yourself in simple terms.
- Comply with local standards and market prices.
- Define a premium product that still offers good value.
- Have strategies to protect your IPR.
- Acquire knowledge of the financing options.
- Understand the reforms to the procurement regulations and the actions now available.
- Invest in building relationships with technical, business and financial partners and exercise due diligence.

The EU SME Centre summarises the main success factors for overcoming barriers as follows:

The Success Factors for Overcoming Barriers



The *European Business in China Position Paper* (Position Paper) 2022-2023 is the European Chamber's (EUCCC) most important publication and the cornerstone of its annual advocacy plan.

<https://www.europeanchamber.com.cn/en/publications-position-paper> compiled by its 41 working groups, sub-working groups and fora over a six-month period, the 967 constructive recommendations contained in the *Position Paper* illustrate both the depth of the challenges faced by European companies in China and their commitment to improving the business environment.

This year's *Executive Position Paper* outlines how, over the last year, there has been a significant shift in focus at the headquarters (HQs) of European companies when evaluating China.

Where discussions once centered primarily on investment opportunities, they are now focused on building supply chain resilience, the challenges of doing business, the risks of reputational damage and ensuring global compliance.

Facing mounting internal and external challenges, Chinese policymaking has shifted. By now prioritizing ideology over economic concerns, China's business environment is becoming less predictable, reliable and efficient.

Opportunities for European companies in China remain, but they must now develop strategies to deal with an ever-growing list of risks, stemming from both emerging legislation—within and outside of China—and geopolitical developments.

The EUCCC lists a number of recommendations for European companies:

- Continue to integrate foreign staff into China operations—as well as Chinese staff into global operations—in order to maintain diverse teams and avoid talent silos.
- Strengthen links between global and China teams, in order to both increase understanding of China among headquarters and develop coherent China strategies.
- Establish 'decoupling teams' to evaluate the costs associated with both localisation in China and disconnection from certain global systems.
- Develop a cost/benefit analysis of adopting either a 'flexible architecture' model that can be localised for different markets or a 'dual system' model that completely separates China production from production for the rest of the world.

- Audit all supply chains to determine the current and future level of exposure to sanctions.
- Adopt a realistic strategy for remaining abreast of, and reacting positively to, changes in markets, public opinion and governments that could have an impact on China operations.
- Avoid entering certain segments, or consider winding down certain business lines, that are exposed to existing or potential sanctions, whenever the costs outweigh the benefits.
- Develop flexible global corporate decarbonisation strategies that can be adjusted in the event that China operations are unable to access green sources of energy.
- Invest and participate more in government advocacy efforts through chambers of commerce, industry associations and standards-setting bodies.

Another source of important information on the Chinese Market is the China IP SME Helpdesk, an EU supported project aimed to help European Companies solve Intellectual Problems in China. The program was launched through EU funding in 2008 and is raising awareness and preparing SME's for IPR issues in China.

They provide free of charge, confidential and business-focused advice to SME's including a helpline, training workshops, webinars, website and Blog, guides and factsheets. According to their experience 80% of all SME's that fail in China fail because they did not protect their IP in China. It is possible to deal with IP rights in China and minimize the risks for SME's and the China IP SME Helpdesk urges the SME's to contact their helpdesk (question@china-iprhelpdesk.eu)

7 Annexes

Annex 1- List of Events and Webinars organized by the CEWP Business Program, 2018-2022

2018							
Date	Venue	Theme	No. of participants	No. of presentations	Cooperating organizations	Links	Products
May 3-5 th 2018	IE Expo Shanghai	Business opportunities for European companies in China	60	7	EU SME Centre, IE Expo	Invitation: https://www.cewp.eu/access-chinese-market-water-technologies Outputs: https://www.cewp.eu/business-workshop-ie-expo-shanghai-2018-how-do-water-business-china	
June 27 th -28 th 2018	CWEC Expo, Qingdao	Rural Water and Business opportunities for European companies in China	200	8	CWEC	Outputs: https://www.cewp.eu/cewp-access-program-activities-cwec-qingdao-international-water-conference https://www.cewp.eu/cewp-held-several-events-during-qingdao-water	3 sessions
November 8 th , 2018	Side-event at Annual High-level Meeting, Beijing	PPP	50	4	MWR	Outputs: https://www.cewp.eu/cewp-high-level-meeting-day-1-closes-successfully	
December 4 th , 2018	Side-event at SLUSH, Helsinki	Digitalization	30	6	ELY	https://www.cewp.eu/registration-now-open-business-event-digitalization-water-slush-helsinki-4th-december	
2019							
Date	Venue	Theme	No. of participants	No. of presentations	Cooperating organisations	Links	Products
April 12-13 th 2019	Qingdao	Industrial water use	170	22	EU SME Centre, WSSTP, EUPIC	Invitation: https://www.cewp.eu/business-event-industrial-water-use-food-sector	1 program

						Outputs: https://www.cewp.eu/information-meetings-qingdai-and-ie-expo-shanghai-april-2019	
April 14 th 2019	Shanghai IE Expo, side event	Industrial water use and technology	30	8	EU SME Centre, WSSTP, EUPIC, Enterprise Europe Network	Invitation: https://www.cewp.eu/business-event-industrial-water-use-food-sector Outputs: https://www.cewp.eu/information-meetings-qingdai-and-ie-expo-shanghai-april-2019	1 program
November 5 th 2019	Amsterdam Aquatech Expo sideevent	China Water Market Outlook	50	2		Invitation: https://www.cewp.eu/newsletter-upcoming-cewp-events Outputs: https://www.cewp.eu/chinese-water-market-dos-and-donts	
November 6 th 2019	Amsterdam Aquatech Expo sideevent	Launch of Urban Water 2020 Program	50	2	Aquatech, Lot 3	Invitation: https://www.cewp.eu/newsletter-upcoming-cewp-events Outputs: https://www.cewp.eu/launch-urban-water-2020	
November 2019	Guimaraes	Ready for China	75	8		Invitation: https://www.cewp.eu/take-part-cewp-business-and-innovation-program-2019-market-segment-theme-industrial-water-use-your	
November 11-12 th 2019	Chengdu EUPIC Twinfair	The Chinese market for industrial water use and technology, B2B and Matchmaking	150	12	EUPIC	Invitation: https://www.cewp.eu/business-event-industrial-water-use Outputs: https://www.cewp.eu/sites/default/files/files/Final%20Draft%20Report%20from%20EU%20China	1 program, 1 report, 2 background documents

						%20Water%20Devel opmner%20Forums %20in%20Chengdu %20and%20Qingda o%20November.pdf (this version will be changed as it is in bad shape)	
November 13-14 th 2019	Qingdao EUPIC Twinfair	Industrial water use and technology, B2B and Matchmaking	150	15	EUPIC	<p>Invitation: https://www.cewp.eu/business-event-industrial-water-use</p> <p>Outputs: <a href="https://www.cewp.eu/sites/default/files/files/Final%20Draft%20Report%20from%20EU%20China%20Water%20Devel
opmner%20Forums
%20in%20Chengdu
%20and%20Qingda
o%20November.pdf">https://www.cewp.eu/sites/default/files/files/Final%20Draft%20Report%20from%20EU%20China%20Water%20Devel opmner%20Forums %20in%20Chengdu %20and%20Qingda o%20November.pdf (this version will be changed as it is in bad shape)</p>	1 program
2021							
Date	Venue	Theme	No. of participants	No. of presentations	Cooperating organisations		
March 16 th 2021	Webinar	Water management in development of Blue-Green cities	40	7	EU SME Centre, Aquatech, RAI, European Commerce, IWA, Lot 3	<p>Invitation: https://www.cewp.eu/business-webinar-water-management-development-blue-green-cities</p> <p>Outputs: https://www.cewp.eu/webinar-blue-green-cities</p>	1 program
March 30 th 2021	Webinar	Efficiency of Urban water infrastructure	80	10	EU SME Centre, Aquatech, RAI, European Commerce, IWA, Lot 3	<p>Invitation: https://www.cewp.eu/business-webinar-efficiency-urban-water-infrastructure</p> <p>Outputs: https://www.cewp.eu/efficiency-water-infrastructure-presentations</p>	
April 29 th 2021	Webinar	Smart water management in the whole urban water cycle	65	11	EU SME Centre, Aquatech, RAI, European Commerce, IWA, Lot 3	<p>Invitation: https://www.cewp.eu/business-webinar-smart-water-managing-</p>	

						whole-urban-water-cycle Outputs: https://www.cewp.eu/smart-water	
May 18 th 2021	Webinar	Carbon Footprint in the urban water sector	40	7	EU SME Centre, Aquatech, RAI, European Commerce, IWA, Lot 3	Invitation: https://www.cewp.eu/business-webinar-carbon-footprint-water-sector Outputs: https://www.cewp.eu/carbon-footprint	
June 2-4 th 2021	Aquatech Shanghai	Digitalization, Circular Economy	80	6	ELY Centre EU SME	Invitation: https://www.cewp.eu/digitalisation-water-sector-aquatech-china-2021 https://www.cewp.eu/digitalisation-water-sector-join-seminar https://www.cewp.eu/join-seminar-about-circular-economy-and-water-sector-aquatech-china-2021 Outputs: https://www.cewp.eu/aquatech	2 events
June 9, 2021	MRW Expo, Wuhan	Urban water-sponge cities, waste water treatment, water reuse, leakage	?	?	EU SME Center Report from Aquatech Shanghai	Invitation: https://www.cewp.eu/cewp-business-exchange-meeting Outputs: https://www.cewp.eu/review-cewp-business-exchange-meeting	
November 2-4 rd 2021	Aquatech Amsterdam	China Market Outlook	65	4		Outputs: https://www.cewp.eu/chinese-water-market-and-technology-outlook-2021-side-events-aquatech-amsterdam	2 events
2022							

Date	Venue	Theme	No. of participants	No. of presentations	Cooperating organisations		
March 29 th 2022	Webinar	Roundtable-CEWP Market and technology outlook	35	5	EU SME Centre, Aquatech, RAI, European Commerce, IWA	<p>Invitation: https://www.cewp.eu/index.php/webinar-series-chinese-market-rural-water-technologies-0</p> <p>Outputs (se et stykke need i teksten): https://www.cewp.eu/index.php/webinar-series-chinese-market-rural-water-technologies</p>	
April 19 th 2022	Webinar	Water supply and wastewater infrastructure in small-medium sized cities	50	10	EU SME Centre, Aquatech, RAI, European Commerce, IWA	<p>Invitation: https://www.cewp.eu/april-19th-webinar-small-scale-water-supply-and-wastewater-infrastructure-small-medium-cities-and</p> <p>Outputs: https://www.cewp.eu/index.php/small-scale-infrastructure-rural-areas</p> <p>Extra output: https://www.cewp.eu/white-paper-small-scale-water-supply-and-sanitation-rural-areas</p>	1 program
May 24 th 2022	Webinar	Improving water quality with better data	40	8	EU SME Centre, Aquatech, RAI, European Commerce, IWA	<p>Invitation: https://www.cewp.eu/webinar-digitalization-water-quality-management-data-generation-value-creation</p> <p>Outputs: https://www.cewp.eu/webinar-improving-water-quality-management-better-data</p>	1 program
Sep-tember 13 th	Seminar and webinar	CEWP Program Business Program	40	3	CEWP Program LOTs	<p>Outputs: https://www.cewp.eu/cewp-at-iwa-event</p>	

November 3rd	Webinar	Water Security	100	3	MWR Water Security	https://www.cewp.eu/water-security-business-exchange-meeting-cewp-2022	
December 12th	Webinar	Business Program	40	5	CEWP Lot 1		
December 15th	Presentation	China Market Outlook	70	-	Asia-Pacific Smart Water Utilities Summit, Singapore		
		Total	1.750	173			

Annex 2- Key References:

EU Chamber of Commerce China Position Paper 2021-2022

<https://www.europeanchamber.com.cn/en/publications-position-paper>

CEWP: Conclusions and main findings from events about Industrial Water (2019):

<https://www.cewp.eu/sites/default/files/files/Final%20Draft%20Report%20from%20EU%20China%20Water%20Developmner%20Forums%20in%20Chengdu%20and%20Qingdao%20November.pdf>

Report specific about China Industrial Wastewater Policy Overview and Opportunities for EU SMEs in Qingdao & Chengdu Area, this report was elaborated for CEWP by the EU SME Centre in 2019:

[https://www.cewp.eu/sites/default/files/files/event%20files/Industrial%20Wastewater%20Report%20\(6th%20September%202019\).pdf](https://www.cewp.eu/sites/default/files/files/event%20files/Industrial%20Wastewater%20Report%20(6th%20September%202019).pdf)

CEWP: Conclusions and main findings from events about Urban Water (2021):

<https://www.cewp.eu/sites/default/files/2021-11/CEWP%20Webinar%20Series%202021%20Draft%20Consolidated%20Report%201406211%20HE%20DIS.pdf>

Presentations and interventions at CEWP webinars and events: <https://www.cewp.eu/news-events>

Circular Economy in the Wastewater Sector

<https://www.cewp.eu/sites/default/files/2021-05/CEWP%20Whitepaper%20Circular%20Economy%20of%20Water%20in%20Waste%20Water%20Treatment%20final.pdf>

China Carbon Neutrality 2030/2060 in the Water Sector

<https://www.cewp.eu/sites/default/files/2021-05/China%20WW%20carbon%20neutrality%203060%20path%20and%20solution%20report%20NORD%20IQ0428.pdf>

China Water Risk: <https://www.chinawaterrisk.org/resources/analysis-reviews/looking-for-water-in-chinas-14fyp/>

Global Water Intelligence, Global Water Market 2017 <https://www.globalwaterintel.com/products-and-services/market-research-reports/global-water-market-2017>

Mordor Intelligence <https://www.mordorintelligence.com/industry-reports/china-water-and-wastewater-treatment-wwt-technology-market>

Qianzhan Industry Research Institute <https://www.qianzhan.com/analyst/detail/220/210802-5abeea82.html> (in Chinese)

